

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-24. (Canceled)

25. (Original) A method of manufacturing a semiconductor device, comprising:
supplying heated gas into a reaction tube; and
switching on/off a light source provided outside of the reaction tube in a pulse
form to heat a substrate disposed in the reaction tube

26. (Original) A method according to claim 25, wherein the light source is at
least one selected from the group consisting of a halogen lamp, a metal halide lamp, a
high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

27. (Original) A method of manufacturing a semiconductor device, comprising
the steps of:

will gas
supplying heated gas into a reaction tube;
switching on/off a light source provided outside of the reaction tube in a pulse
form to heat a substrate disposed in the reaction tube; and
supplying gas cooled to a temperature equal to or lower than a room
temperature into the reaction tube to cool the substrate.

28. (Original) A method according to claim 27, wherein the light source is at
least one selected from the group consisting of a halogen lamp, a metal halide lamp, a
high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

29. (Original) A method of manufacturing a semiconductor device comprising:

disposing a substrate in a reaction tube;

heating the substrate in a first stage by switching on/off a light source in a pulse form with a cycle of one second or shorter, the light source provided outside of the reaction tube; and—

heating the substrate in a second stage by switching on/off the light source in a pulse form with a cycle of one second or longer to heat the substrate disposed in the reaction tube.

a 30. (Original) A method according to claim 29, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

31 (Original) A method of manufacturing a semiconductor device comprising:
disposing a substrate in a reaction tube;
supplying heated gas to the reaction tube;
heating the substrate in a first stage by switching on/off a light source in a pulse form with a cycle of one second or shorter, the light source provided outside of the reaction tube; and

heating the substrate in a second stage by switching on/off the light source in a pulse form with a cycle of one second or longer to heat the substrate disposed in the reaction tube.

32. (Original) A method according to claim 31, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

33. (Original) A method of manufacturing a semiconductor device, comprising:
disposing a substrate in a reaction tube;

supplying heated gas into the reaction tube under a reduced pressure; and
heating the substrate disposed in the reaction tube by switching on/off a light
source provided outside of the reaction tube in a pulse form.

34. (Original) A method according to claim 33, wherein the light source is at
least one selected from the group consisting of a halogen lamp, a metal halide lamp, a
high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

35. (Original) A method of manufacturing a semiconductor device, comprising
the steps of:

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disposing a substrate in a reaction tube;
supplying heated gas into the reaction tube under a reduced pressure;
heating a substrate disposed in the reaction tube by switching on/off a light
source provided outside of the reaction tube in a pulse form; and
supplying gas cooled to a temperature equal to or lower than a room
temperature into the reaction tube to cool the substrate.

36. (Original) A method according to claim 35, wherein the light source is at
least one selected from the group consisting of a halogen lamp, a metal halide lamp, a
high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

37. (Original) A method of manufacturing a semiconductor device comprising:
disposing a substrate in a reaction tube;
keeping the reaction tube under reduced pressure;
heating the substrate in a first stage by switching on/off a light source in a pulse
form with a cycle of one second or shorter, the light source provided outside of the
reaction tube;

heating the substrate in a second stage by switching on/off the light source in a pulse form with a cycle of one second or longer.

38. (Original) A method according to claim 37, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

a 39. (Original) A method of manufacturing a semiconductor device comprising:
disposing a substrate in a reaction tube;
supplying heated gas in the reaction tube while keeping the reaction tube under a reduced pressure;

heating the substrate in a first stage by switching on/off a light source in a pulse form with a cycle of one second or shorter, the light source provided outside of the reaction tube;

heating the substrate in a second stage by switching on/off the light source in a pulse form with a cycle of one second or longer.

40. (Original) A method according to claim 39, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

41. (Original) A method of manufacturing a semiconductor device, comprising:
disposing a semiconductor film, in which an impurity region of one conductive type is formed, in a reaction tube;
supplying heated gas into the reaction tube; and
heating the semiconductor film disposed in the reaction tube by switching on/off a light source provided outside of the reaction tube.

42. (Original) A method according to claim 41, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

43. (Original) A method of manufacturing a semiconductor device, comprising: disposing a semiconductor film, in which an impurity region of one conductivity type is formed, in a reaction tube;

supplying heated gas into the reaction tube;

heating the semiconductor film disposed in the reaction tube by switching on/off a light source provided outside of the reaction tube in a pulse form; and

supplying gas cooled to a temperature equal to or lower than a room temperature into the reaction tube to cool the semiconductor film.

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44. (Original) A method according to claim 43, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

45. (Original) A method of manufacturing a semiconductor device, comprising: disposing a semiconductor film, in which an impurity region of one conductivity type is formed, in a reaction tube;

heating the semiconductor film disposed in the reaction tube in a first stage by switching on/off a light source provided outside of the reaction tube in a pulse form with a cycle of one second or shorter; and

heating the semiconductor film in a second stage by switching on/off the light source in a pulse form with a cycle of one second or longer.

46. (Original) A method according to claim 45, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

47. (Original) A method for manufacturing a semiconductor device, comprising:
disposing a semiconductor film, in which an impurity region of one conductive
type is formed, in a reaction tube;

supplying heated gas into the reaction tube;

heating the semiconductor film disposed in the reaction tube in a first stage by
switching on/off a light source provided outside of the reaction tube in a pulse form with
a cycle of one second or shorter; and

heating the semiconductor film in a second stage by switching on/off the light
source in a pulse form with a cycle of one second or longer.

48. (Original) A method according to claim 47, wherein the light source is at
least one selected from the group consisting of a halogen lamp, a metal halide lamp, a
high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

49. (Original) A method for manufacturing a semiconductor device, comprising:
disposing a semiconductor film, in which an impurity region of one conductive
type is formed, in a reaction tube;

supplying heated gas into the reaction tube under a reduced pressure; and

heating the semiconductor film disposed in the reaction tube by switching on/off
a light source provided outside of the reaction tube in a pulse form.

50. (Original) A method according to claim 49, wherein the light source is at
least one selected from the group consisting of a halogen lamp, a metal halide lamp, a
high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

51. (Original) A method for manufacturing a semiconductor device, comprising:
disposing a semiconductor film, in which an impurity region of one conductive
type is formed, in a reaction tube;
supplying heated gas into the reaction tube under a reduced pressure;
heating the semiconductor film disposed in the reaction tube by switching on/off
a light source provided outside of the reaction tube in a pulse form; and
supplying gas cooled to a temperature equal to or lower than a room
temperature into the reaction tube to cool the semiconductor film.

52. (Original) A method according to claim 51, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

53. (Original) A method of manufacturing a semiconductor device, comprising:
disposing a semiconductor film, in which an impurity region of one conductive
type is formed, in a reaction tube;
keeping the reaction tube under a reduced pressure;
heating the semiconductor film disposed in the reaction tube in a first stage by
switching on/off a light source provided outside of the reaction tube in a pulse form with
a cycle of one second or shorter; and
heating the semiconductor film in a second stage by switching on/off the light
source in a pulse form with a cycle of one second or longer.

54. (Original) A method according to claim 53, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

55. (Original) A method of manufacturing a semiconductor device, comprising:

disposing a semiconductor film, in which an impurity region of one conductive type is formed, in a reaction tube;
keeping the reaction tube under a reduced pressure;
supplying heated gas into the reaction tube; and
heating the semiconductor film disposed in the reaction tube in a first stage by switching on/off a light source provided outside of the reaction tube in a pulse form with a cycle of one second or shorter; and
heating the semiconductor film in a second stage by switching on/off the light source in a pulse form with a cycle of one second or longer.

56. (Original) A method according to claim 55, wherein the light source is at least one selected from the group consisting of a halogen lamp, a metal halide lamp, a high-pressure mercury lamp, a high-pressure sodium lamp, and a xenon lamp.

CM 57. (Original) A method according to claim 25 wherein the semiconductor device is a video camera.

58. (Original) A method according to claim 25 wherein the semiconductor device is a digital camera.

59. (Original) A method according to claim 25 wherein the semiconductor device is a goggle type display.

60. (Original) A method according to claim 25 wherein the semiconductor device is a car navigation system.

61. (Original) A method according to claim 25 wherein the semiconductor device is a sound reproduction device.

62. (Original) A method according to claim 25 wherein the semiconductor device is a personal computer.

63. (Original) A method according to claim 25 wherein the semiconductor device is a game apparatus.

64. (Original) A method according to claim 25 wherein the semiconductor device is a portable information terminal.

65. (Original) A method according to claim 25 wherein the semiconductor device is an image playback device.

al 66. (Original) A method according to claim 27 wherein the semiconductor device is a video camera.

67. (Original) A method according to claim 27 wherein the semiconductor device is a digital camera.

68. (Original) A method according to claim 27 wherein the semiconductor device is a goggle type display.

69. (Original) A method according to claim 27 wherein the semiconductor device is a car navigation system.

70. (Original) A method according to claim 27 wherein the semiconductor device is a sound reproduction device.

71. (Original) A method according to claim 27 wherein the semiconductor device is a personal computer.

72. (Original) A method according to claim 27 wherein the semiconductor device is a game apparatus.

73. (Original) A method according to claim 27 wherein the semiconductor device is a portable information terminal.

74. (Original) A method according to claim 27 wherein the semiconductor device is an image playback device.

al 75. (Original) A method according to claim 29 wherein the semiconductor device is a video camera.

76. (Original) A method according to claim 29 wherein the semiconductor device is a digital camera.

77. (Original) A method according to claim 29 wherein the semiconductor device is a goggle type display.

78. (Original) A method according to claim 29 wherein the semiconductor device is a car navigation system.


79. (Original) A method according to claim 29 wherein the semiconductor device is a sound reproduction device.

80. (Original) A method according to claim 29 wherein the semiconductor device is a personal computer.

81. (Original) A method according to claim 29 wherein the semiconductor device is a game apparatus.

82. (Original) A method according to claim 29 wherein the semiconductor device is a portable information terminal.

83. (Original) A method according to claim 29 wherein the semiconductor device is an image playback device.

 84. (Original) A method according to claim 31 wherein the semiconductor device is a video camera.

85. (Original) A method according to claim 31 wherein the semiconductor device is a digital camera.

86. (Original) A method according to claim 31 wherein the semiconductor device is a goggle type display.

87. (Original) A method according to claim 31 wherein the semiconductor device is a car navigation system.

88. (Original) A method according to claim 31 wherein the semiconductor device is a sound reproduction device.

89. (Original) A method according to claim 31 wherein the semiconductor device is a personal computer.

90. (Original) A method according to claim 31 wherein the semiconductor device is a game apparatus.

91. (Original) A method according to claim 31 wherein the semiconductor device is a portable information terminal.

92. (Original) A method according to claim 31 wherein the semiconductor device is an image playback device.

al 93. (Original) A method according to claim 33 wherein the semiconductor device is a video camera.

94. (Original) A method according to claim 33 wherein the semiconductor device is a digital camera.

95. (Original) A method according to claim 33 wherein the semiconductor device is a goggle type display.

96. (Original) A method according to claim 33 wherein the semiconductor device is a car navigation system.

97. (Original) A method according to claim 33 wherein the semiconductor device is a sound reproduction device.

98. (Original) A method according to claim 33 wherein the semiconductor device is a personal computer.

99. (Original) A method according to claim 33 wherein the semiconductor device is a game apparatus.

100. (Original) A method according to claim 33 wherein the semiconductor device is a portable information terminal.

101. (Original) A method according to claim 33 wherein the semiconductor device is an image playback device.

102. (Original) A method according to claim 35 wherein the semiconductor device is a video camera.

103. (Original) A method according to claim 35 wherein the semiconductor device is a digital camera.

104. (Original) A method according to claim 35 wherein the semiconductor device is a goggle type display.

105. (Original) A method according to claim 35 wherein the semiconductor device is a car navigation system.

106. (Original) A method according to claim 35 wherein the semiconductor device is a sound reproduction device.

107. (Original) A method according to claim 35 wherein the semiconductor device is a personal computer.

108. (Original) A method according to claim 35 wherein the semiconductor device is a game apparatus.

109. (Original) A method according to claim 35 wherein the semiconductor device is a portable information terminal.

110. (Original) A method according to claim 35 wherein the semiconductor device is an image playback device.

111. (Original) A method according to claim 37 wherein the semiconductor device is a video camera.

112. (Original) A method according to claim 37 wherein the semiconductor device is a digital camera.

113. (Original) A method according to claim 37 wherein the semiconductor device is a goggle type display.

114. (Original) A method according to claim 37 wherein the semiconductor device is a car navigation system.

115. (Original) A method according to claim 37 wherein the semiconductor device is a sound reproduction device.

116. (Original) A method according to claim 37 wherein the semiconductor device is a personal computer.

117. (Original) A method according to claim 37 wherein the semiconductor device is a game apparatus.

118. (Original) A method according to claim 37 wherein the semiconductor device is a portable information terminal.

119. (Original) A method according to claim 37 wherein the semiconductor device is an image playback device.

120. (Original) A method according to claim 39 wherein the semiconductor device is a video camera.

121. (Original) A method according to claim 39 wherein the semiconductor device is a digital camera.

122. (Original) A method according to claim 39 wherein the semiconductor device is a goggle type display.

123. (Original) A method according to claim 39 wherein the semiconductor device is a car navigation system.

124. (Original) A method according to claim 39 wherein the semiconductor device is a sound reproduction device.

125. (Original) A method according to claim 39 wherein the semiconductor device is a personal computer.

126. (Original) A method according to claim 39 wherein the semiconductor device is a game apparatus.

127. (Original) A method according to claim 39 wherein the semiconductor device is a portable information terminal.

128. (Original) A method according to claim 39 wherein the semiconductor device is an image playback device.

al 129. (Original) A method according to claim 41 wherein the semiconductor device is a video camera.

130. (Original) A method according to claim 41 wherein the semiconductor device is a digital camera.

131. (Original) A method according to claim 41 wherein the semiconductor device is a goggle type display.

132. (Original) A method according to claim 41 wherein the semiconductor device is a car navigation system.

133. (Original) A method according to claim 41 wherein the semiconductor device is a sound reproduction device.

134. (Original) A method according to claim 41 wherein the semiconductor device is a personal computer.

135. (Original) A method according to claim 41 wherein the semiconductor device is a game apparatus.

136. (Original) A method according to claim 41 wherein the semiconductor device is a portable information terminal.

137. (Original) A method according to claim 41 wherein the semiconductor device is an image playback device.

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138. (Original) A method according to claim 43 wherein the semiconductor device is a video camera.

139. (Original) A method according to claim 43 wherein the semiconductor device is a digital camera.

140. (Original) A method according to claim 43 wherein the semiconductor device is a goggle type display.

141. (Original) A method according to claim 43 wherein the semiconductor device is a car navigation system.


142. (Original) A method according to claim 43 wherein the semiconductor device is a sound reproduction device.

143. (Original) A method according to claim 43 wherein the semiconductor device is a personal computer.

144. (Original) A method according to claim 43 wherein the semiconductor device is a game apparatus.

145. (Original) A method according to claim 43 wherein the semiconductor device is a portable information terminal.

146. (Original) A method according to claim 43 wherein the semiconductor device is an image playback device.

 147. (Original) A method according to claim 45 wherein the semiconductor device is a video camera.

148. (Original) A method according to claim 45 wherein the semiconductor device is a digital camera.

149. (Original) A method according to claim 45 wherein the semiconductor device is a goggle type display.

150. (Original) A method according to claim 45 wherein the semiconductor device is a car navigation system.

151. (Original) A method according to claim 45 wherein the semiconductor device is a sound reproduction device.

152. (Original) A method according to claim 45 wherein the semiconductor device is a personal computer.

153. (Original) A method according to claim 45 wherein the semiconductor device is a game apparatus.

154. (Original) A method according to claim 45 wherein the semiconductor device is a portable information terminal.

155. (Original) A method according to claim 45 wherein the semiconductor device is an image playback device.

al 156. (Original) A method according to claim 47 wherein the semiconductor device is a video camera.

157. (Original) A method according to claim 47 wherein the semiconductor device is a digital camera.

158. (Original) A method according to claim 47 wherein the semiconductor device is a goggle type display.

159. (Original) A method according to claim 47 wherein the semiconductor device is a car navigation system.

160. (Original) A method according to claim 47 wherein the semiconductor device is a sound reproduction device.

161. (Original) A method according to claim 47 wherein the semiconductor device is a personal computer.

162. (Original) A method according to claim 47 wherein the semiconductor device is a game apparatus.

163. (Original) A method according to claim 47 wherein the semiconductor device is a portable information terminal.

164. (Original) A method according to claim 47 wherein the semiconductor device is an image playback device.

165. (Original) A method according to claim 49 wherein the semiconductor device is a video camera.

166. (Original) A method according to claim 49 wherein the semiconductor device is a digital camera.

167. (Original) A method according to claim 49 wherein the semiconductor device is a goggle type display.

168. (Original) A method according to claim 49 wherein the semiconductor device is a car navigation system.

169. (Original) A method according to claim 49 wherein the semiconductor device is a sound reproduction device.

170. (Original) A method according to claim 49 wherein the semiconductor device is a personal computer.

171. (Original) A method according to claim 49 wherein the semiconductor device is a game apparatus.

172. (Original) A method according to claim 49 wherein the semiconductor device is a portable information terminal.

173. (Original) A method according to claim 49 wherein the semiconductor device is an image playback device.

a 174. (Original) A method according to claim 51 wherein the semiconductor device is a video camera.

175. (Original) A method according to claim 51 wherein the semiconductor device is a digital camera.

176. (Original) A method according to claim 51 wherein the semiconductor device is a goggle type display.

177. (Original) A method according to claim 51 wherein the semiconductor device is a car navigation system.

178. (Original) A method according to claim 51 wherein the semiconductor device is a sound reproduction device.

179. (Original) A method according to claim 51 wherein the semiconductor device is a personal computer.

180. (Original) A method according to claim 51 wherein the semiconductor device is a game apparatus.

181. (Original) A method according to claim 51 wherein the semiconductor device is a portable information terminal.

182. (Original) A method according to claim 51 wherein the semiconductor device is an image playback device.

al 183. (Original) A method according to claim 53 wherein the semiconductor device is a video camera.

184. (Original) A method according to claim 53 wherein the semiconductor device is a digital camera.

185. (Original) A method according to claim 53 wherein the semiconductor device is a goggle type display.

186. (Original) A method according to claim 53 wherein the semiconductor device is a car navigation system.

187. (Original) A method according to claim 53 wherein the semiconductor device is a sound reproduction device.

188. (Original) A method according to claim 53 wherein the semiconductor device is a personal computer.

189. (Original) A method according to claim 53 wherein the semiconductor device is a game apparatus.

190. (Original) A method according to claim 53 wherein the semiconductor device is a portable information terminal.

a/ 191. (Original) A method according to claim 53 wherein the semiconductor device is an image playback device.

192. (Original) A method according to claim 55 wherein the semiconductor device is a video camera.

193. (Original) A method according to claim 55 wherein the semiconductor device is a digital camera.

194. (Original) A method according to claim 55 wherein the semiconductor device is a goggle type display.

195. (Original) A method according to claim 55 wherein the semiconductor device is a car navigation system.

196. (Original) A method according to claim 55 wherein the semiconductor device is a sound reproduction device.

197. (Original) A method according to claim 55 wherein the semiconductor device is a personal computer.

198. (Original) A method according to claim 55 wherein the semiconductor device is a game apparatus.

al 199. (Original) A method according to claim 55 wherein the semiconductor device is a portable information terminal.

200. (Original) A method according to claim 55 wherein the semiconductor device is an image playback device.